Aesys S.p.A.
Management & Coordination by Aesys Holding S.r.l.
VAT Number - Tax Payer's Code - Registration no. at:
Registro:

Share Capital € 5.000.000 fully paid-up
Trade Register in Bergamo 02052370166
AEE IT08020000001058

Compact TFT Family for Indoor and Semi-Outdoor use

PRODUCT SPECIFICATIONS

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Compact TFT Family for Indoor and Semi-Outdoor use
PRODUCT SPECIFICATION

PROJECT CODE	PRODUCT CODE
Compact Indoor / Semi-Outdoor	-

Rev.	Description	Author	Approved	Date
27	General Update (added optical and mechanical performances)	Giuseppe Manenti	Mario Alvino	24th February 2023

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1. Introduction

Product overview with general features and product specifications.

OVERVIEW

The "Compact TFT Family for Indoor and Semi-Outdoor use" is a visualization system based on 32" Matrix modules and an Industrial Embedded PC.
The displays are designed for public information provided in indoor and semi outdoor areas.
The displays feature a wide viewing angle, high brightness, high contrast and wide aspect ratio.

Fig.: 1 – Example of Passenger Entertainment (on left) and Passenger Information (on right)

General Features:

- Visualization area composed of a TFT matrix LED back lighted;
- Typical brightness: 500cd/m2 (on Matrix Module);
- Resolution of 1920x1080px (on size 32")

- Aspect ratio of: 16:9;
- Central unit composed of an industrial embedded PC;
- Operating temperature range: 0°C / +50°C;
- Materials and components are selected on the basis of their fire/flame resistance and low smoke emission;
- High reliability without any maintenance required;
- Onsite Maintenance (Preventive & Corrective; direct access by frontal door of main components);
- Ethernet communication (on CU) for firmware / software update and data transmission;
- Ready for Landscape or Portrait installation types;
- Ready for audio information system or audio entertainment;

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Upon request:

- Extended operating temperature up to -25°C÷50°C;
- Up to 6mm tempered monolithic glass or laminated glass 3+3mm and different glass treatments;
- Monitor can be equipped with audio for passenger information in audio format;
- Wireless communication via 2G/3G/4G network or Wi.fi;
- Fiber optic (multimode);
- TTS / PMR;
- Shock sensor;

Mechanical characteristics:

- Aluminum housing to ensure rigid body and minimal weight;
- Front protection based on 4mm Antireflective tempered monolithic glass;
- IP65 protection degree;

Fig.: 2 – Perspective view

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Installation typologies:

- The installation of the displays is performed via female fixing points placed on the rear side according to the VESA standard, which ensure a wide compatibility with the common installation brackets.

Fig.: 3 – Rear view – Fixing points according to the standard VESA

- Different installation typology supported: Wall, Ceiling, Pole & Embedded

Fig.: 4 – Example of Pole support installation

Fig.: 5 – Example of Ceiling Installation

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Serviceability:

The monitors are composed of two main structures: Rear housing and front door. The rear housing represents the main structure where all the electric and electronic components (power supply and management boards) are installed while the front door hosts the TFT module and the front protection. The front door is design to be opened onsite to allow access to the internal parts. This solution brings these benefits:

- Designed for Onsite Maintenance (both preventive and corrective): direct access to the main components by the front door;
- Adopted concept design focuses a quick on-site corrective and preventive maintenance;
- All components are accessible at first level;
- Quick release fast plug and play module provided by adapters;
- No special tools required;
- One man Maintenance – Weight of a single replaceable units is less than 25Kg (front door excluded);
- Direct thermal heating spreading through the aluminum chassis allows a fanless, no filter system;
- Diagnostic and Configuration can be performed remotely.

Fig.: 6 – Serviceability concept

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2. Product Specifications

General overview regarding product specifications

GENERAL INFORMATION

Norms	EN 62368-1 - Audio/video, information and communication technology equipment - Part 1: Safety requirements EN 50121-1 – Railway applications - Electromagnetic compatibility - Part 1: General EN 50121-4 – Railway applications - Electromagnetic compatibility - Part 4: Emission and immunity of the signalling and telecommunications apparatus EN 61000-3-2 – Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current <= 16 A per phase) EN 61000-3-3 – Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection EN 61000-4-11 – Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests EN 61000-6-4 – Electromagnetic compatibility (EMC) - Part 6-4: Generic standards – Emission standard for industrial environments EN 62262 – Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code) EN 60529 – Degrees of protection provided by enclosures (IP Code) EN 60068-2-1 (test Ad) – Environmental testing - Part 2: Tests - Tests A: Cold EN 60068-2-2 (test Bd) – Environmental testing - Part 2-2: Tests - Test B: Dry heat ISO9241-307 – Ergonomics of human-system interaction — Part 307: Analysis and compliance test methods for electronic visual displays Cables Standards IEC 60332-1-2, IEC 60332-2-2, IEC 60754-1, IEC 61034-2 (whenever applicable in accordance with the state of the art of cable technology)
Compliance to	Device with technical features in accordance with the requirements of PRM TSI - Commission Regulation (EU) No 1300/2014 on the technical specifications for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility
Conformity	CE
Version	Single sided
Typical application	Indoor / Semi-outdoor (roofed) as long as no sunrays hit the display neither on the housing nor on the front glass.
Installation	Wall / Ceiling / Embedded * / Pole support (for further details see the attached mechanical drawing) * Clearance for heat dissipation: at least 150mm on all sides
Installation mode	Landscape / Portrait
Tilting	The display could be installed with a tilt between 0° and 10°: inside this range it is guaranteed that the display will respect mechanical and thermal project behavior (according to the bracket – Not provided)

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MECHANICAL

Size	TFT 32"				
Dimensions	784 (L) x 478 (H) x 104 (D) mm				
Estimated Weight	28kg				
Finishing Front and Rear	Front: Anodized Aluminum Coating type: Interpon MW005JR (Grey), Smooth, powder coating Coating process: Painting Cycle for Aluminium – External use – C4 environment				
	Rear: Aluminum Coating type: RAL 9005, 60% GLOSS, not reflecting MAT, powder coating Coating process: Painting Cycle for Aluminium – External use – C4 environment				
	Powder painting conditions according to Technical Specifications "Aesthetic Spec on Powder Painting_Q"				
Protection grade:	IP 65				
Front protection	Antireflective Tempered monolithic glass (*) (IK07 compliant in accordance with EN 62262)				
	Upon request : *- up to 6mm tempered monolithic glass (*)* *- laminated glass up to 3+3mm (*)* *- Different glass treatments.*				
	* Note – Tempered monolithic glass is fine for ground installations. Laminated glass recommended for installations at more than 2m height.				
	Front protection conditions according to Technical Specifications "Aesthetic Spec on Glass Screen_Q"				
Lock system	Hinged door, polyurethane bi-component vulcanized gasket; Special anti-vandal locks				
Interfaces	1x Power Supply 1x RJ45 Data Line 1x Optional Audio Output (for further details see the attached mechanical drawing)				
Fixing points	VESA standard 200x200mm, 4xM8				
	Female closed holes (for further details see the attached mechanical drawing)				
Other	Mechanical housing compliant to IK10 20J according to the EN62262				
Wind resistance:	Ref. Norm: UNI EN 1991-1-4 Max. Wind Speed: 18 m/s Terrain category = Cat. III Installation height: 2-3m				

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Size 43" and 49" to be developed

ELECTRICAL

Size	TFT 32"				
Input power supply voltage	Nominal 100-120 / 220-240 V_{AC}				
Input power supply frequency range	50/60Hz				
Protections	Overload, overvoltage, over temperature				
Power Consumption	Typ.: 70W (@ 70% Brightness)				
	Max.: 85W (@ 100% Brightness)				

ENVIRONMENTAL

Operating temperature	0° ÷ 50° Celsius
	Upon request: extended operating temperature range down to -25°C. *Minimum temperature for cold Start: -10°C.*
Thermal management	At high temperature: - Automatic TFT-LCD matrix brightness linear derating down to maximum 50% with increase of the environmental temperature - TFT-LCD matrix and PC switched OFF when the highest temperature limit is reached
	At low temperature: - Display is switched off when the lowest temperature limit is reached
Operating humidity	10 % ÷ 95 % R.H. without condensation
Storage temperature	-20° ÷ 60° Celsius — Ambient temperature 10% ÷ 95% - R.H. at this conditions: - till +40°C @90% R.H. - till +50°C @60% R.H. - till +60°C @40% R.H.
Cooling system	Fanless (filterless)
Heating system	*Upon request, as usual combined with the extended operating temperature range*
Temperature Sensor	Installed
Light Sensor	Installed
Acceleration Sensor	*Upon request*

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DATA COMMUNICATION

Type of communication	Copper LAN Ethernet 10/100/1000 Base TX
Protocol type	Differentprotocoltypessupported(accordingtothesoftwareplayerhosted) SNMP protocol for diagnostic data
Other:	Upon request: - Built-in LAN Ethernet 10/100Base TX to 100Base FX Media converter (multimode) (for further details refer to the commercial offer)

CONNECTORS

Power supply	1x Harting PushPull Power 2/0, panel feed-through and connector, 3-poles (2+PE)
Data line	1x Harting PushPull RJ45 Technology, RJ45-panel jack feed-through
Audio output	1x Cable Gland
Other	Power cable and any other external interfacing cables are not included (available upon request)

OPTICAL SPECIFICATIONS (MATRIX MODULE)

Size	TFT 32”				
Format	16:9				
Type	Normally black				
Active area	698.4 (H) x 392.85 (V) mm				
Pixel pitch	0.36375 x 0.36375 mm x RGB				
Pixel format	1920 (H) x 1080 (V)				
Colour depth	16.7M colors				
Luminance (typical on White colour @ the centre point)	500 cd/mq				
Contrast ratio	4000 : 1 typ.				
Viewing angle (CR> 10)	R/L 178° (typ.) — U/D 178° (typ.)				
Response time	8ms (Typ., Grey-to- Grey)				
Backlight Technology	LED				
Note	Class Pixel II according to ISO9241-307				

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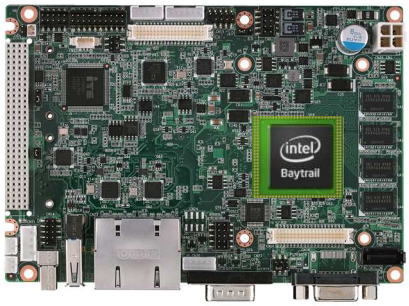
BRIGHTNESS CONTROL

Setting:	Automatic / Adjustable

PC EMBEDDED



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CPU type	**FHD version**: x86 Intel Celeron J1900	**4K version**: Intel Atom E39xx
CPU speed	2.00GHz Quad Core	1.60GHz Quad Core
Memory Provided	4GB	
	Upon request: 8GB (*)	
Display Controller	Graphic features: DirectX11/10/9, OpenGL4.2/4.0/3.2, OpenGL-ES 2.0, OpenCL1.2 HW Decode: H.264, MPEG2, MVC, VC-1, WMV9, MJPEG and VP8 HW Encoder: H.264, MPEG	Graphic features: DirectX12, OpenGL4.3, OpenCL2.0 HW Decode: H.264 (L5.2), MPEG2, MVC, VC-1, WMV9, MJPEG and VP8, H.265 (HEVC) HW Encoder: H.264, MPEG, H.265 (HEVC)
Video output interface	LVDS (48-bit LVDS up to WUXGA 1920 x 1200 at 60Hz) HDMI or combination between DisplayPort (DP) / VGA / DVI-D	LVDS (48-bit LVDS up to 1.4b (3840 x 2160 at 30Hz) HDMI or combination between DisplayPort (DP) / VGA / DVI-D
Ethernet	Speed: 10/100/1000Mbps Connector: 1x RJ45	
Audio	High Definition Audio (HD), Line-in, Line out, Mic-in	
Watchdog Timer	Output system reset, Programmable counter from 1 ÷ 255 minutes/seconds	
Storage Interface	SATA II / mSATA: (Full-size)	
Storage Provided	Capacity: 32GB SSD	
	Upon request: - 64/128GB storage capacity SSD (*) - External HDD up to 1TB (*)	
I/O Connector (min.)	1x 10/100/1000Mbps Ethernet on RJ45 1x USB 2.0 / 1x USB 3.0 / 1x RS232	
OS (Compatible)	Microsoft Windows 10 IoT Enterprise Entry Linux (Additional Codec or Player Licenses as Adobe Flash are not included)	

*** Optional configuration (available upon request)**

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DIAGNOSTIC, CONTROL & SETUP

Control	Ambient Light sensor IrDA
Diagnostic	Power supply Internal Temperature Backlight Status External PC HW Watchdog
Control & setup	Remote via Ethernet through SNMP protocol Locally via IRDA interface Locally via VNC (virtual network computing)
LED Status	Green: Power Status Orange Ethernet Activity Red: Fault / Watchdog

RAMS VALUES

MTBF:(Mean time between failures)	>50.000 hrs* * note: standard configuration with backlight included
MTTR:(Maximum time to internal components replacement)	20 min onsite
Other	-

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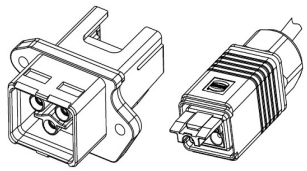
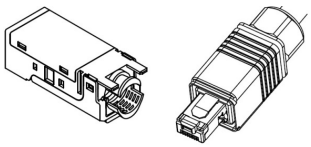
3. Connectors Pinout

Connectors type and signals description

POWER SUPPLY

Connector Type	Pin #	Signal	Description
 Harting Push pull V4 Power plug	1	L	Line 230Vac power input
	2	N	Neutral 230Vac power input
	3	GND	Ground

ETHERNET DATA LINE

Connector Type	Pin #	Signal	Description
 Harting Push pull V4 RJ45	1	TX+	Transmit Data +
	2	TX-	Transmit Data -
	3	RX+	Receive Data +
	4	BI_DC+ (GHz)	DC+ for GBe
	5	BI_DC- (GHz)	DC- for GBe
	6	RX-	Receive Data -
	7	BI_DD+ (GHz)	DD+ for GBe
	8	BI_DD- (GHz)	DD- for GBe

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4.Option: Audio

The High Definition Audio (HD) output of the embedded PC can be connected to an external “Slim Sound Bar”.

The “Slim Sound Bar” is an optional module to enable the audio diffusion. High quality electronic components, are used to obtain better sound, high Signal/Noise ratio, low Total Harmonic Distortion (THD+N), wide frequency response range.

Generally it can be coupled with any display or external sound system, but the Compact TFT Family devices are the ones considered as main application and so taken as reference for the Sound Bar design. Due to the various Compact TFTs size, the Sound Bar has been designed with different lengths.

Additionally, even different configurations (Mono, Stereo, etc.) are available depending from the final application (Information only or Entertainment).

For the details please refer to “Slim Sound Bar Family” datasheet.

Fig.: 7 – Compact with Slim Sound Bar

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5. Option: TTS / PMR

The Device **(*)** can be equipped with an audio system composed of a TTS module board and a loudspeaker (externally mounted). The audio system is directly connected to the Embedded PC in order to be able to vocalize the messages currently displayed on the panel.

Audio system activation can be performed via RF interface or pushbutton.

For the details on loudspeaker please refer to “Slim Sound Bar Family” datasheet.

AUDIO ANNOUNCEMENT HARDWARE SPECIFICATIONS
AUDIO PERFORMANCES

TTS Sampling Frequency	22KHz (variable value on request)
TTS/MP3 bit-rate	96kbit/s (variable value on request)
Frequency response	105Hz – 20kHz
Audio output power	max: 20W @ 12VDC at 4ohms)

NOTE

- TTS Language: one language of the supported ones as standard. More languages available upon request
- TTS Activation via RS interface or push button
- TTS Software: ACAPELA

- Automatic volume adjustment according to the Ambient noise or Manual volume adjustment on different times of day (via configuration file);

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6. Attachments

- “73 170 4 02 - Compact TFT 32'' ETH Single Sided”
- Painting process: Painting Cycle for Aluminium – External use – C4 environment
- Aesthetic Spec on Powder Painting_Q
- Aesthetic Spec on Glass Screen_Q

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